

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Week 7

Week 8

Week 9

Lecture 17 - Block Diagram Reduction and Position Regulator

Lecture 18 - Control of a single joint

Week 9 - Lecture Notes

Quiz : Assignment 9

Feedback for Week 9

Assignment 9 Solutions

Week 10

Week 11

Week 12

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Assignment 9

The due date for submitting this assignment has passed.

Due on 2021-03-24, 23:59 IST.

As per our records you have not submitted this assignment.

- 1) The transfer function is defined as 1 point
- ratio of input joint torque to input joint speed
 - ratio of output joint torque to output joint speed
 - ratio of input to output
 - ratio of output to input

No, the answer is incorrect.
Score: 0

Accepted Answers:
ratio of output to input

- 2) In reality a robot control system 1 point
- has a single input (desired position)
 - is a linear control system
 - has two inputs (desired position and dynamic effects)
 - is not affected by the link dynamics

No, the answer is incorrect.
Score: 0

Accepted Answers:
has two inputs (desired position and dynamic effects)

- 3) A spring (k), mass (m) and damper (b) system is critically damped when 1 point
- $b^2 = 4mk$
 - $b^2 < 4mk$
 - $b^2 > 4mk$
 - None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $b^2 = 4mk$

- 4) The function of a gear in the control of a single robot joint is to 1 point
- increase the speed and torque
 - increase speed and decrease torque
 - decrease speed and increase torque
 - decrease the speed and torque

No, the answer is incorrect.
Score: 0

Accepted Answers:
decrease speed and increase torque

- 5) Although a robot control system is a two input system, a linear control system functions reasonably well because 1 point
- the dynamic effects are reduced by the square of the gear ratio
 - the gears reduce the speed of the motors so that less error occurs at reduced speed
 - inertia forces are generally negligible
 - All of the above are correct

No, the answer is incorrect.
Score: 0

Accepted Answers:
the dynamic effects are reduced by the square of the gear ratio

- 6) In the model of the armature of a DC servo motor, the total voltage is 1 point
- (Input voltage + Back emf)
 - (Input voltage - Back emf)
 - (Input voltage - Back emf) x Motor const.
 - (Input voltage + Back emf) x Motor const.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Input voltage - Back emf)

- 7) For a two input system like a robot link, the transfer function is found by 1 point
- superposition of individual transfer functions for the two inputs
 - subtraction of individual transfer functions for the two inputs
 - multiplication of individual transfer functions for the two inputs
 - taking ratio of individual transfer functions for the two inputs

No, the answer is incorrect.
Score: 0

Accepted Answers:
superposition of individual transfer functions for the two inputs

- 8) A system is stable if the poles of the system 1 point
- lie on the right side of the imaginary axis
 - lie on the left side of the imaginary axis
 - lie above the real axis
 - lie below the real axis

No, the answer is incorrect.
Score: 0

Accepted Answers:
lie on the left side of the imaginary axis

- 9) In the PD control of a second order system if the proportional gain k_p is increased, the system 1 point
- becomes faster
 - becomes slower
 - may become faster or slower depending upon the system
 - error remains unaffected

No, the answer is incorrect.
Score: 0

Accepted Answers:
becomes faster

- 10) A robot link controlled by a PID controller does not have any steady state error but 1 point
- can lead to faster rise time
 - can lead to high oscillation
 - can become unstable for low integral gains
 - can become unstable for high integral gains

No, the answer is incorrect.
Score: 0

Accepted Answers:
can become unstable for high integral gains